

Amended Claims

IAP16 Rec'd PCT/PTO

1. Device for use in sports and games for detecting the position of impact of a moveable object, such as a ball, in particular tennis ball, baseball or the like, comprising a sheet or mat (1,10) with an outer (2) and an inner (8) layer, the sheet or mat (1,10) forming a target surface and having embedded therein a plurality of electrically conductive elements (12A,13A;12B,13B) forming pressure sensitive switches distributed over the target surface and communicating with electronic circuits (33) for outputting, processing and displaying (35) electrical signals from pressure sensitive switches (12A,13A;12B,13B) when activated by said impact or pressure,

characterized in that:

- the underneath side of the outer layer (2) of the sheet or mat (1,10) is provided with a first pattern of electrically conductive elements (13A;12B) at least at the positions of the pressure sensitive switches,

- the upper side of the inner layer (8) of said sheet or mat (1,10) is provided with a second pattern of electrically conductive elements (12A;13B) at least at the positions of the pressure sensitive switches,

- the first pattern of electrically conductive elements (13A;12B) and the second pattern of electrically conductive elements (12A;13B) are arranged so as to enable temporary contact to be established at the positions of the pressure sensitive switches,

- an insulation layer (5) between said outer and inner layers (2,8) is provided with cavities or holes (50) at the positions of the pressure sensitive switches (12A,13A;12B,13B) for establishing temporary contact therein, and from each cavity or hole (50) at least one opening (51) directed sideways for air movement during said impact or pressure activation, and

- at least one of the first and second patterns of electrically conductive elements (12A,13A;12B,13B), is subdivided into a number of individual zones (A,B,C,D..., X,Y,Z...), where each zone comprises a plurality of said pressure sensitive switches (12A,13A;12B,13B), and the electronic circuits (33) have separate connections (30A,30B) to each of said individual zones.

2. Device according to claim 1, wherein the character and/or the thickness of the insulation layer (5) determine(s) the detection sensitivity.

3. Device according to claim 1 or 2, wherein the second pattern of electrically conductive elements (12A;13B) is applied on an upward surface of an inner support layer (3) joined with the inner layer (8).

4. Device according to any one of claims 1-3, intended for use with a moveable object, in particular in the form of a ball, having a given size, wherein said positions of the pressure sensitive switches (12A,13A;12B,13B) are mutually spaced in such a way that the ball or the object by impact or pressure will activate at least two pressure sensitive switches (12A;12B).

5. Device according to any one of claims 1-4, wherein said first and/or said second pattern of electrically conductive elements (12A,13A;12B,13B;13A',13A'';13B',13B'') are/is formed by printed circuit elements.

6. Device according to any one of claims 1-5, wherein the outer layer (2) of the sheet or mat (1,10) is further provided with a hollow and flexible, dome-shaped protrusion (2A) at each position of the pressure sensitive switches (12B,13B), each zone comprising a number of protrusions (2A).

7. Device according to claim 6, wherein said hollow and flexible protrusions (2A) inherently provides for a sufficient degree of elastic deformation when activated by said impact or pressure, which also affects the degree of detection accuracy.

8. Device according to claim 6 or 7, wherein said hollow and flexible protrusions (22A) are further provided with spring elements (25), preferably of metal, for obtaining a sufficient degree of elastic deformation when activated by said impact or pressure.

9. Device according to any one of claims 6-8, wherein the shape of said protrusions (2A,10A,10B,10C...) is substantially circular as seen in plan view.

10. Device according to any one of claims 1-9, wherein the surface of the sheet or mat (1,10) is provided with at least one line (11X) corresponding to a line (11) that is to be found on a standard field or court for the sport or game concerned, where at least some of the zones (10p) border said at least one line (11X).

11. Device according to claim 10, wherein said at least one line (11X), located or provided on said surface, contains line zones (20p) having pressure sensitive switches, preferably with said line zones arranged in the longitudinal direction of said at least one line (11X).